

WHAT IS CLAIMED:

1. A permanent magnet alloy consisting essentially of, in weight percent, 27 to 35 of a rare earth element, including Nd in an amount of at least 50% of the total rare earth element content, 0.8 to 1.3 B, up to 30 Co, 40 to 75 Fe, 0.03 to 0.3 C, 0.2 to 0.8 oxygen and up to 1 of at least one of Cu, Ga and Ag.

2. The permanent magnet alloy of claim 1, wherein at least one of Cu, Ga and Ag is 0.02 to 0.5%.

3. The permanent magnet alloy of claim 1, wherein at least one of Pr or La is substituted for up to 50% of the Nd.

4. The permanent magnet alloy of claim 1, wherein at least one of Dy or Tb is substituted for up to 50% of the Nd.

5. The permanent magnet alloy of claim 1, wherein Co is 0.5 to 5%.

6. The permanent magnet alloy of claim 1, wherein Cu is 0.02 to 0.5%.

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7. The permanent magnet alloy of claims 1, 2, 3, 4, 5, or 6, including up to 5% of at least one additional transition element selected from the group consisting of Al, Si, Sn, Zn, Nb, Mo, V, W, Cr, Zr, Hf, Ti and Mg.

Sub B1
8. A method for producing a carbon- and oxygen-containing permanent magnet alloy, said method comprising producing an alloy consisting essentially of, in weight percent, 27 to 35 of a rare earth element, including Nd in an amount of at least 50% of the total rare earth element content, 0.8 to 1.3 B, up to 30 Co, 40 to 75 Fe, up to 1 of at least one of Cu, Ga and Ag; producing prealloyed particles and/or blends thereof from said alloy, contacting said particles with a carbon-containing material to produce a carbon content therein of 0.03 to 0.3 and contacting said particles with an oxygen-containing material to produce an oxygen content therein of 0.2 to 0.8.

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9. The method of claim 8, further comprising said carbon-containing material being a metal stearate.

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10. The method of claim 9, further comprising contacting said particles with said metal stearate and thereafter reducing the size of said particles.

⁴/~~11~~. The method of claims ²/~~9~~ or ³/~~10~~, wherein said metal stearate is zinc stearate.

⁵/~~12~~. The method of claim ³/~~10~~, further comprising employing milling for reducing the size of said particles.

⁶/~~13~~. The method of claim ⁵/~~12~~, wherein said milling is jet milling.

⁹/~~14~~. The method of claim ¹/~~8~~, further comprising said oxygen containing material being air.

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a' ¹⁵/~~15~~. The method of claim 14, further comprising contacting said particles with said air during or after reducing the size of said particles.

⁸/~~16~~. The method of claim ⁷/~~15~~, further comprising contacting said particles with said air during jet milling for reducing the size of said particles.

¹⁰/~~17~~. The method of claim ¹/~~9~~, further comprising said carbon-containing material and said oxygen-containing material being carbon dioxide.

¹¹/~~18~~. The method of claim ¹/~~8~~, further comprising at least one of Cu, Ga and Ag is 0.02 to 0.5.

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19. The method of claim 8, further comprising at least one of Pr or La is substituted for up to 50% of Nd.

20. The method of claim 8, further comprising at least one of Dy or Tb is substituted for up to 50% of Nd.

¹²/~~21~~. The method of claim ¹/~~8~~, further comprising Co of 0.5 to 5%.

¹³/~~22~~. The method of claim ¹/~~8~~, wherein the permanent magnet alloy includes up to 5% of at least one additional transition element selected from the group consisting of Al, Si, Zn, Nb, Mo, V, W, Cr, Zr, Hf, Ti and Mg.

23. A permanent magnet alloy consisting essentially of, in weight percent, 29 to 34 of a rare earth element including Nd in an amount of at least 50% of the total rare earth element content, 0.9 to 1.2 B, up to 15 Co, 40 to 75 Fe, 0.05 to 0.15 C, 0.3 to 0.8 oxygen and up to 0.5 of at least one of Cu, Ga and Ag.

24. The permanent magnet alloy of claim 23, wherein at least one of Cu, Ga and Ag is 0.02 to 0.5%.

25. The permanent magnet alloy of claim 23, wherein at least one of Pr or La is substituted for up to 50% of the Nd.

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26. The permanent magnet alloy of claim 23, wherein Dy or Tb is substituted for up to 50% of the Nd.

27. The permanent magnet alloy of claim 23, wherein Co is 0.5 to 5%.

28. The permanent magnet alloy of claim 22, wherein Cu is 0.02 to 0.5%.

29. The permanent magnet alloy of claims 23, 24, 25, 26, 27, or 28, including up to 5% of at least one additional transition element selected from the group consisting of Al, Si, Sn, Zn, Nb, Mo, V, W, Cr, Zr, Hf, Ti and Mg.

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